A Basic Forwarding Strategy for Ad-hoc Networks in NFD

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Need

- NFD is mainly designed for wired networks, and has few features for wireless ad hoc networks, such as a wireless ad hoc forwarding strategy. However, there are many wireless ad hoc networks, such as wireless sensor networks and vehicle networks, where NDN is a good fit.
- A lot of efforts have been made to simulate NDN in these scenarios in ndnSIM. According to their feedbacks, it is not easy to run their expected scenarios correctly (requiring many hacks), because of limited supports in both ndnSIM and NFD.
- We try to explore what kind of supports necessary to be added to ndnSIM and NFD for wireless ad hoc scenarios. In addition, we intend to provide a basic forwarding strategy for a simple wireless ad hoc scenario with basic simulations.

Approach

- Challenges:
  - Challenge 1: ndnSIM 2.6 does not have the latest version of NFD, which can allow forwarding strategies to flexible control Data forwarding.
    - Solution: Update ndnSIM to the latest version (with Alex's update on Gerrit)
  - Challenge 2: we have "ad hoc" Faces in NFD and forwarding behaviours can be customized based on this attribute, such as forwarding Interest/Data to the incoming face. However, they cannot be configured in ndnSIM.
    - Solution: add check in ndnSIM: if a scenario is using wifi-ad-hoc, the corresponding NFD face will be created as "ad hoc"
  - Challenge 3: a basic forwarding strategy
    - Design Assumptions: that each node has one ad hoc Face to the ad hoc network, and the default route "/" is set to it.